a) a polymer having multiple functional groups at least one of which is covalently bound to a therapeutic or diagnostic agent, and at least one cell uptake promoter is covalently bound to the therapeutic or diagnostic agent; or

b) a polymer and at least one cell uptake promoter bound thereto; the polymer further comprising multiple functional groups at least one of which is covalently bound to a therapeutic or diagnostic agent.

The conjugates described above include compounds having the general formula:

a) $(X)_o$-$(Y)_m$-$(linker)_n$

where X is one or more transporter, receptor, binding or targeting ligands, including retro inverso peptides, which may be identical or non-identical;

where Y is one or more of any therapeutic or diagnostic moieties, naturally occurring or artificial, including retro inverso peptides, which may be identical or non-identical;

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where linker comprises polymer with functional groups and provides covalent bonds between linker and Y; and

m, n, and o may be any independently varying integers, or more specifically may each independently vary from 1 to about 100; or

b) $(Y)_m$-$(linker)_n$-$(X)_o$

where X is one or more transporter, receptor, binding or targeting ligands, including retro inverso peptides, which may be identical or non-identical;

where Y is one or more of any therapeutic or diagnostic moieties, naturally occurring or artificial, including retro inverso peptides, which may be identical or non-identical;

where linker comprises polymer with functional groups and provides covalent bonds between linker and X, and/or Y, or the combination thereof; and

m, n, and o may be any independently varying integers, or more specifically may each independently vary from 1 to about 100.

B2

17. The linker may be a linear or branched polymer, for example, poly(ethylene glycol), carboxymethylcellulose, dextran, polyvinyl alcohol, polyvinyl pyrrolidone, poly-1,3-dioxolane,

poly-1,3,6-trioxane, an amino acid homopolymer, polypropylene oxide, a copolymer of ethylene glycol/propylene glycol, an ethylene/maleic anhydride copolymer, an amino acid copolymer, an amino acid copolymer of polyethylene glycol and an amino acid, a polypropylene oxide/ethylene oxide copolymer, and a polyethylene glycol/thiomalic acid copolymer. Poly(ethylene glycol) is preferred. Branched polyethylene glycol is most preferred. The linker may have a molecular weight ranging from about 200 to about 200,000 Daltons; preferably 2,000 to about 50,000 Daltons, and most preferably about 10,000 Daltons. The multiple thiol compounds are attached to said polymer at an interval, preferably the interval is every about 100 to about 10,000 Daltons; most preferably it is about 300 to about 5,000 Daltons.

18. The cell uptake promoter, transporter, receptor, binding or targeting ligand may be a vitamin such as, but not limited to, biotin, pantothenate, vitamin B6, or vitamin B12, or analogs thereof. It may also be a carbohydrate for which a transporter exists, such as for glucose and glucose derivatives. It may also be a chemotactic peptide such as a formyl-methionyl peptide. Examples of other peptide targeting agents with a range of size and amino acid order includes the peptide formyl-methionyl-leucyl-phenylalanine (fMLF) peptide and variants thereof which serves as a transport enhancing moiety and increases drug delivery into cells expressing the receptor for that peptide. fMLF is only one example of the class of formyl-methionyl peptides that binds to this receptor. Other examples include other formylmethionyl peptides and proteins capable of binding to the formyl peptide receptor on the surface of phagocytic cells, which also has been reported to bind to certain other, unrelated peptides lacking the formylmethionyl moiety, and these latter peptides unrelated to formylmethionyl peptides but capable of binding to the receptor are fully embraced herein. Other transport enhancing moieties may include Tat-biotin, retro-inverso (RI)-Tat, and RI-TAT-biotin. It may be a chemokine, such as RANTES or IL-2. It may also be a peptide such as Tat, penetratin or VEGF, or a membrane fusion peptide such as gp41. It may also be an enzyme such as neuraminidase. It may be an antibody or an antibody fragment with specific affinity for lymphocyte subpopulations, neurons or other cell types. Examples of such antibodies include antibodies to CD4, which may target helper T-cells, or CD44, which may target ovarian cancer cells. It may also be an antigen or epitope such as influenza virus hemagglutinin. It may also be a hormone such as estrogen, progesterone, LHRH, ACTH or growth hormone. It may also be an adhesion molecule such as ICAM, NCAM or a lectin. It may also be a lipid, such as myristic acid or stearic acid. It may be an oligonucleotide or

an antisense oligonucleotide such as aptamers containing 5-(1-pentyl)-2'-deoxyuridine. These are merely non-limiting examples. Any of the cell uptake promoters embraced herein may be provided as a form which is capable of being covalently attached to a polymer or therapeutic agent as described above, such as through a functional or reactive group on the cell uptake promoter or by a chemical modification to provide one.

B2

169. Injection of PEG/A-fMLF$_4$-DIG$_4$ into the peritoneal cavity of BALB/c mice was used to determine the in vivo properties of this conjugate, in contrast to using the differentiated HL-60 cell line. The mice in this study were not injected with thioglycol, and, therefore, the macrophages in the peritoneal cavity were not activated. These non-activated peritoneal cells accumulated DIG to about a 5-fold greater extent from the targeted conjugate, PEG/A-fMLF$_4$-DIG$_4$, than from the non-targeted conjugate, PEG/A-DIG$_8$ (Figure 15). In fact, 17% of the administered PEG/A-fMLF4-DIG4 was taken up by peritoneal cells, whereas they accumulated only 3.3% of the non-targeted PEG/A-DIG$_8$. This low level of accumulation of non-targeted DIG is not surprising, since we have shown that in culture there is some nonspecific binding of PEG/A to promyelocytic HL-60 cells (Figure 24). Peritoneal incubation for less than 1 h (15 or 30 min) gave similar results. It should be noted that the DIG that was accumulated in cells is expected to remain conjugated to its PEG/A carrier, but this was not confirmed.

B3

IN THE CLAIMS:

Please cancel claims 1-68 and add the following new claims 69-193.

69. (New) A method for delivery of a therapeutic or a diagnostic agent from an initial bodily compartment to at least one target bodily compartment, the method comprising administering to the initial bodily compartment an effective transcompartmental delivery promoting amount of:

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a) a polymer having multiple functional groups at least one of which is covalently bound to a therapeutic or diagnostic agent, and at least one cell uptake promoter covalently bound to said therapeutic or diagnostic agent; or

b) a polymer and at least one cell uptake promoter covalently bound thereto; the polymer further comprising multiple functional groups at least one of which is covalently bound to a therapeutic or diagnostic agent.